PROJECT facts
U.S. Department of Energy
National Energy Research Laboratory

**Materials and Advanced Metallurgical Research**
11/2001

# Development of Advanced Alloys for Fossil Power Generation Applications

**Project Lead**
Oak Ridge National Laboratory (ORNL)
Oak Ridge, TN

**Description** **Duration: 10/1/97 - 9/30/01**

The objective of this project is to evaluate structural alloys for improved performance of high-temperature components in advanced combined-cycle, coal combustion systems, and components needed for advanced processes such as those defined in Vision 21 systems. Assessments are underway to determine the potential of using a modified type 310 stainless steel for construction of components in such advanced cycles. Other materials of interest and evaluation include HR120, HR160, alloy 803, and cast HP-40Nb. All such alloys were judged as having potential applicability and performance indices are being identified for comparative purposes. This project includes a CRADA between Oak Ridge National Laboratory and INCO Alloys International, Inc. to develop a modified alloy that is considerably stronger at high-temperatures (particularly, creep-resistant) and as, or more, corrosion resistant than alloy 800H, but is otherwise similar for engineering considerations. The project also includes a CRADA with McDermott Technologies, Inc., to use state-of-the-art methods of material evaluation and analysis to determine the safe use limits for advanced ferritic steels that are candidates for construction of fossil power supercritical and ultra-supercritical boiler superheater components.

## Product Support Areas

| Gasification Technologies | Combustion Technologies | Sequestration | Environmental & Water Resources | Advanced Turbine & Engines | Fuel Cells |
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NETL

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